Patent Claims

1. Use of a two-component composition which comprises

   A) a polyol component, which contains

      A1) one or several low molecular weight polyols with a molecular weight of 160 to 600 g/mol and a hydroxyl group concentration of 5 to less than 20 mol hydroxyl groups per kg of low molecular weight polyol,

      A2) one or several higher molecular weight polyols with an average functionality of ≥ 2 and a hydroxyl group concentration of less than 5 mol hydroxyl groups per kg of higher molecular weight polyol and

      A3) one or several light-resistant aromatic amines, and

   B) a polyisocyanate component, which contains one or several polyisocyanates,

   for the production of flexible polyurethane gel coats for synthetic resin composite materials, wherein the synthetic resin comprises epoxy resin and/or vinyl ester resin and is not, or not completely, cured at the time when it is brought into contact with the gel coat.

2. Use according to claim 1, **characterized in that** at 23°C the gel coat displays an elongation at break (measured as per DIN EN ISO 527) of at least 3%, preferably greater than 4%, in particular greater than 5%.

3. Use according to claim 1 or 2, **characterized in that** the polyurethane gel coat is not, or not completely, cured at the time when it is brought into contact with the synthetic resin, wherein the bringing into contact with the synthetic resin is preferably an application of synthetic resin onto the gel coat.

4. Use according to one of the previous claims, **characterized in that** the synthetic resin used comprises one or several reinforcing materials, wherein glass fibre fabric and/or glass fibre nonwoven and plastic fibre fabric or carbon fibre bonded fabric are preferred as reinforcing material and the synthetic resin used is especially preferably a prepreg, in particular an epoxy resin prepreg with glass fibre fabric and/or glass fibre nonwoven or an injection resin.

5. Use according to one of the previous claims, **characterized in that** the light-resistant aromatic amine, dissolved in toluene (20 wt. % amine in toluene), mixed at 23°C with an equimolar quantity of an oligomeric HDI isocyanate with an NCO content of about 5.2 mol/kg and a viscosity in the range from 2750 to 4250 mPas, dissolved in toluene (80 wt. % isocyanate in toluene) gives a gel time of more than 30 seconds, preferably more than 3 minutes, more preferably more than 5 minutes, in particular more than 20 minutes (determined as per E-DIN VDE 0291-2, 1997-06, section 9.2.1).

6. Use according to one of the previous claims, **characterized in that** the light-resistant aromatic amine, dissolved in toluene (25 wt. % amine in toluene), mixed at 23°C with an equimolar quantity of an oligomeric HDI isocyanate with an NCO content of about 5.2 mol/kg and a viscosity in the range from 2750 to 4250 mPas, gives a mixture, where the mixture, when applied onto inert white test plates and cured in the forced-air oven for 30 minutes at 80°C and then for 60 minutes at 120°C, gives a coating with a dry layer thickness of about 20 µm, and the coating on 300-hour artificial weathering as per ASTM-G 53 (4 hrs UVB 313, 4 hrs condensation) gives a colour shade change delta E (measured as per DIN 5033 part 4 and assessed as per DIN 6174) of at most 50, preferably at most 45, in particular at most 40, such as at most 30.

7. Use according to one of the previous claims, **characterized in that** the light-resistant aromatic amine is a methylenebisaniline, in particular a 4,4'-methylenebis(2,6-dialkylaniline).

8. Use according to claim 7, **characterized in that** the light-resistant aromatic amine is 4,4'-methylenebis(3-chloro-2,6-diethylaniline).

9. Use according to one of the previous claims, **characterized in that** the content of light-resistant aromatic amine in the polyol component, based on the total mass of the components A1, A2 and A3 of the polyol component, lies in the range from 0.1 to 20 wt. %, preferably 0.3 to 10 wt. %, more preferably 0.5 to 5 wt. %, and in particular 1 to 3 wt. %.

10. Use according to one of the previous claims, **characterized in that** the content of low molecular weight polyol in the polyol component, based on the total mass of the components A1, A2 and A3 of the polyol component, lies in the range from 2 to 60 wt. %.

11. Use according to claim 10, **characterized in that** the content of low molecular weight polyol in the polyol component, based on the total mass of the components A1, A2 and A3 of the polyol component, lies in the range from 5 to 50 wt. %, preferably 10 to 45 wt. %, more preferably 20 to 40 wt. %, and in particular 30 to 35 wt. %.

12. Use according to one of the previous claims, **characterized in that** the hydroxyl group concentration of the low molecular weight polyol lies in the range from 6 to 15, more preferably in the range from 9 to 11 mol hydroxyl groups per kg of low molecular weight polyol.

13. Use according to one of the previous claims, **characterized in that** the low molecular weight polyol is selected from straight-chain or branched polycaprolactone diols, polycaprolactone triols, polycaprolactone tetrols, polyester polyols, polypropylene oxide triols, polyether polyols and polytetramethylene oxide diols.

14. Use according to one of the previous claims, **characterized in that** the higher molecular weight polyol is selected from polyester polyols and polyether polyols, polycarbonate polyols, polyacrylate polyols, polyols based on fatty chemical raw materials such as dimeric fatty acids or natural oils such as castor oil.

15. Use according to one of the previous claims, **characterized in that** the higher molecular weight polyol has a hydroxyl group concentration of 1 to 4.99, preferably 2 to 4, in particular 2.5 to 3.8 mol hydroxyl groups per kg of higher molecular weight polyol.

16. Use according to one of the previous claims, **characterized in that** the content of higher molecular weight polyol in the polyol component, based on the total mass of the components A1, A2 and A3 of the polyol component, lies in the range from 97 to 30 wt. %, preferably 90 to 40 wt. %, more preferably 80 to 45 wt. % and in particular 70 to 50 wt. %.

17. Process for the production of synthetic resin composite materials with flexible polyurethane gel coats, which comprises
(i) the mixing of a two-component composition which comprises

A) a polyol component, which contains

A1) one or several low molecular weight polyols with a molecular weight of 160 to 600 g/mol and a hydroxyl group concentration of 5 to less than 20 mol hydroxyl groups per kg of low molecular weight polyol,

A2) one or several higher molecular weight polyols with an average functionality of ≥ 2 and a hydroxyl group concentration of less than 5 mol hydroxyl groups per kg of higher molecular weight polyol and

A3) one or more light-resistant aromatic amines,

and

B) a polyisocyanate component which contains one or several polyisocyanates,

and at least partial curing of the mixture and

(ii) the bringing of the mixture into contact with synthetic resin, wherein the synthetic resin comprises epoxy resin and/or vinyl ester resin and is not, or not completely, cured at the time when it is brought into contact with the gel coat.

18. Synthetic resin composite material with flexible polyurethane gel coat, producible by the process according to claim 17.

19. Composite material according to claim 18, **characterized in that** it is a wind vane or a part thereof.